

REMARKS

Prior to this Reply, Claims 1-7, 9-27, 30-36, 39-41 and 44-67 were pending. Through this Reply, Claims 1-7, 9-13, 15-22, 24-27, 30-34, 36, 39-41, 44, 45, 47-49, 51-54 and 60-67 have been amended, while Claims 68-77 have been added. Accordingly, Claims 1-7, 9-27, 30-36, 39-41 and 44-77 are now at issue in the present case.

I. Rejection of Claims Under 35 U.S.C. § 102(b)

The Examiner rejected Claims 1-7, 9-13, 15-22, 24-27, 30-36, 39-41, 44, 45 and 60-65 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,945,427 to Cunningham (hereinafter “Cunningham ‘427”).

A. Claim 1

Applicants submit that Claim 1 (as amended) is patentable over Cunningham ‘427 because Cunningham ‘427 fails to disclose a disk drive wherein the skew angle decreases as the head moves from the inner diameter to the outer diameter of the disk.

In contrast, all embodiments disclosed by Cunningham ‘427 provide for a skew angle that increases as the head moves from the inner track to the outer track of the disk. Moreover, Cunningham ‘427 requires that the skew angle increase in this manner:

The present invention practices CFR (i.e. constant data rate and disk RPM recording), by making use of a magnetic recording head whose generally linear gap is skewed, in a continuously increasing manner, to the disk radius at the location of each disk track, from the inner to the outer track, and wherein the disk’s radial track density is caused to increase as the written track widths become narrower. (Col. 1, lines 50-57).

In accordance with the invention, a skewed-gap head is moved on a path across the disk in a manner to provide

progressively increasing gap skew, and thereby progressively narrower tracks, as the head moves from the disk's innermost to its outermost track. (Col. 3, lines 3-7).

While the invention finds utility with a variety of heads and head actuator means known to those skilled in the art, a requirement of the invention is that the head gap be oriented, and that the head be moved, so as to transduce tracks of decreasing track width, from the disk's inner track-N to its outer track-1, and that track-to-track spacing decrease, from the disk's inner track-N to its outer track-1. (Col. 5, lines 3-10) (Emphasis added).

In Cunningham '427 the skew angle must increase as the head moves from the inner diameter to the outer diameter so that the track width and track spacing decrease from the inner diameter to the outer diameter, thereby providing constant data rate and disk RPM recording.

In Claim 1, on the other hand, the skew angle must decrease as the head moves from the inner diameter to the outer diameter. Advantageously, this minimizes track misregistration at the outer diameter where it is often highest due to disk flutter:

Track misregistration is commonly higher toward the outer diameter 76 due to a number of factors such as disk flutter. Advantageously, by decreasing the skew angle as the head 24 moves from the inner diameter 74 to the outer diameter 76, the effective widths 82, 86 of the read and write elements 40, 50 increase as the head 24 moves from the inner diameter 74 to the outer diameter 76, thereby minimizing track misregistration towards the outer diameter 76 where it is most problematic. (Substitute Specification, page 13, lines 20-25).

For at least the above reasons, Applicants submit that Claim 1 is patentably distinguishable from Cunningham '427.

B. Claims 7, 17, 26, 32 and 45

Claims 7, 17, 26, 32 and 45 have been amended in a manner similar to Claim 1.

Accordingly, Applicants submit that Claims 7, 17, 26, 32 and 45 are patentably distinguishable from Cunningham ‘427 for reasons similar to those provided in connection with Claim 1.

C. Claims 2-6, 9-13, 15, 16, 18-22, 24, 25, 27, 30, 31, 33-36, 39-41, 44 and 60-65

Applicants submit that Claims 2-6, 9-13, 15, 16, 18-22, 24, 25, 27, 30, 31, 33-36, 39-41, 44 and 60-65 (all of which depend, directly or indirectly, from one of Claims 1, 7, 17, 26, 32 and 45) are patentably distinguishable from Cunningham ‘427 for reasons similar to those provided in connection with Claim 1.

II. Rejection of Claims 14 and 23 Under 35 U.S.C. § 103

The Examiner rejected Claims 14 and 23 under 35 U.S.C. § 103(a) as being unpatentable over Cunningham ‘427 in view of U.S. Patent No. 5,793,550 to Nepala et al. (hereinafter “Nepala”). Applicants submit that Claims 14 and 23 are patentably distinguishable from Cunningham ‘427 and Nepala at least because such claims depend from Claims 7 and 17, respectively.

III. Rejection of Claims 46-59, 66 and 67 Under 35 U.S.C. § 103

The Examiner rejected Claims 46-59, 66 and 67 under 35 U.S.C. § 103(a) as being unpatentable over Cunningham ‘427 in view of U.S. Patent No. 5,790,341 to Cunningham (hereinafter “Cunningham ‘341”).

A. Claims 49 and 54

Applicants have amended Claims 49 and 54 in a manner similar to Claim 1.

Accordingly, Applicants believe that Claims 49 and 54 are patentably distinguishable from Cunningham '427 and Cunningham '341 for reasons similar to those presented in connection with Claim 1.

B. Claims 46-48, 50-53, 55-59, 66 and 67

Applicants believe that Claims 46-48, 50-53, 55-59 and 66-67 are patentable at least because they depend, directly or indirectly, from one of Claims 45, 49 and 54.

IV. New Claims 68-77

Applicants believe that new Claim 68 is patentably distinguishable from Cunningham '427 for reasons similar to those presented in connection with Claim 1, and new Claims 69-77 are patentable at least because they depend from Claim 68.

V. Amendments to Claims

The claims have been amended to improve clarity. No new matter has been added.

VI. Amendments to Specification

A substitute specification without claims (and a marked-up version thereof) is provided herein under 37 C.F.R. 1.125 to improve clarity of the specification. No new matter has been added.

Applicants respectfully request that the substitute specification be entered.

VII. Amendments to Drawings

Applicants are submitting replacement Figures 1-9 (contained on Replacement Sheets 1-5) to improve the quality of the drawings.

Figure 1 has been modified to clarify bearing assembly 26.

Figure 2 has been modified to clarify read element 40, read gap 42, first shield 44, second shield 46, write gap 48, write element 50, write element width 52, read element width 54 and arrow 56.

Figure 3 has been modified to clarify read element 40, read element width 54, first connecting lead 58, second connecting lead 60, arrows 62, 64 and 66 and stripe height 68.

Figure 4 has been modified to clarify actuator arm assembly 18, center 38, actuator pivot 70, midpoint 72, inner diameter 74 and outer diameter 76.

Figure 5 has been modified to clarify head 24, read element 40, first shield 44, second shield 46, write element 50, track 78, high skew angle 80, read element effective width 82, read element physical width 84, write element effective width 86, write element physical width 88, track width 90, effective shield spacing 110 and physical shield spacing 112.

Figure 6 has been modified to clarify track 78, track width 90, track centerline 92, zero skew element 94, high skew element 96, zero skew element nominal width 100, zero skew element tolerance 102, high skew element nominal width 104, high skew angle 106 and high skew element tolerance 108.

Figure 7 has been modified to clarify actuator arm assembly 18, flexure arm 20, actuator arm 22, head 24, inner diameter 74, outer diameter 76, high mounting angle 114, actuator arm centerline 116 and high skew angle 118.

Figure 8 has been modified to clarify actuator arm assembly 18, flexure arm 20, actuator arm 22, head 24, inner diameter 74, outer diameter 76, actuator arm centerline 116, high mounting angle 120, flexure arm centerline 122 and high skew angle 124.

Figure 9 has been modified to clarify actuator arm assembly 18, flexure arm 20, actuator arm 22, head 24, inner diameter 74, outer diameter 76, actuator arm assembly 126 and high skew angle 128.

No new matter has been added. Figures 1-9 constitute all of the drawings of the application.

VIII. Additional Claim Fees

In determining whether additional claim fees are due, reference is made to the Fee Calculation Table (below).

Fee Calculation Table

	Claims Remaining After Amendment		Highest Number Previously Paid For	Present Extra	Rate	Additional Fee
Total (37 CFR 1.16(c))	70	Minus	60	= 10	x \$50 =	\$ 500.00
Independent (37 CFR 1.16(b))	9	Minus	8	= 1	X \$200 =	\$ 200.00

As set forth in the Fee Calculation Table (above), Applicants previously paid claim fees for sixty (60) total claims and for eight (8) independent claims. Therefore, Applicants hereby authorize the Commissioner to charge the credit card identified on the enclosed Form PTO-2038 in the amount of \$700.00 for the presentation of ten (10) total claims over sixty (60) and one (1) independent claim over eight (8). Although Applicants believe that no other fees are due, the Commissioner is hereby authorized to charge Deposit Account No. 50-2198 for any fee deficiencies associated with filing this paper.

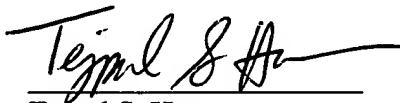
IX. Conclusion

It is believed the above comments establish patentability. Applicants do not necessarily accede to the assertions and statements in the Office Action, whether or not expressly addressed.

Applicants believe that the application appears to be in form for allowance. Accordingly, reconsideration and allowance thereof is respectfully requested.

The Examiner is invited to contact the undersigned at the below-listed telephone number regarding any matters relating to the present application.

Respectfully submitted,



Tejpal S. Hansra
Registration No. 38,172
Hansra Patent Services
4525 Glen Meadows Place
Bellingham, WA 98226
(360) 527-1400

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